ABSTRACT OF THE DISCLOSURE

16 QAM (Quadrature Amplitude Modulation) and 16 APSK (Asymmetric Phase Shift Keying) TTCM (Turbo Trellis Coded Modulation) with minimum bandwidth efficiency of 3 bit/s/Hz (bits per second per Hertz) using a rate 2/4 constituent encoder.

5   Various encoder designs are presented that are operable to generate a signal whose modulation may vary as frequently as on a symbol by symbol basis while providing relatively very high throughput. Rate control sequences including RCs (Rate Controls), arranged in a period, govern the manner in which symbols of a signal are generated. The RCs correspond to various modulations that may each have a unique constellation and

10   corresponding mapping. Different RCs may be included within a rate control sequence that correspond to 16 QAM, 16 APSK, QPSK (Quadrature Phase Shift Key), or even other modulation types. In addition, 1 or more uncoded bits may be used to generate the symbols of the coded signal.